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DIE TUBERKULOSE

IHRE AUSBREITUNG
UND BEKÄMPFUNG
IM DEUTSCHEN REICH



THE TUBERCULOSIS

ITS SPREAD
AND THE MEASURES
FOR ITS SUPPRESSION
IN THE GERMAN EMPIRE



DARGEBOten VOM
KAISERLICHEN GESUNDHEITSAMT
UND VOM
DEUTSCHEN ZENTRAKKOMITEE
ZUR BEKÄMPFUNG DER TUBERKULOSE

OFFERED BY
THE IMPERIAL BOARD OF HEALTH
AND THE
GERMAN CENTRAL-COMMITTEE
FOR COMBATING TUBERCULOSIS

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MEMORANDUM ON TUBERCULOSIS.

COMPILED AT „KAISERLICH DEUTSCHES GESUNDHEITSAMT“ AT BERLIN.

A. WHAT IS TUBERCULOSIS?

Tuberculosis is the most destructive of all infectious diseases. It attacks various parts of the body, chiefly however the lungs; it spares no nation, no age, no vocation, no class of people. More than 100 000 persons die each year in Germany from the effects of it, the number of patients afflicted by it being estimated as ten times as numerous. Every third person, who dies between the ages of 15 and 60 years, succumbs to tuberculosis.

Tuberculosis is caused by the tubercle-bacillus discovered by Robert Koch. This is a minute creature of the lowest scale, visible only when very highly magnified. It thrives best at blood temperature (about 98 degrees Fahrenheit) and multiplies in the interior of the body. It reaches the outer world chiefly in the sputum of sick persons and in the milk of diseased animals.

Every person is exposed to the danger of taking up the germs of tuberculosis into his own system, and many harbor them a long time without knowing it.¹⁾ Every one must therefore be prepared for battle with this enemy.

The tubercle-bacillus is most efficiently destroyed by burning, boiling or steaming. It can not long resist the action of sunlight. Other means of disinfection, such as cresol water, a solution of carbolic acid, formaldehyd, require a special previous knowledge for safe and effective use.

B. HOW DOES THE INFECTION TAKE PLACE?

Hereditary tuberculosis is rare.

Tubercle-bacilli enter the human body mainly by the respiratory organs and the digestive system.

Tubercle-bacilli are taken up:

1. **By inhaling with the air:** germs either from the dried sputum of tuberculous persons in the dust, whirled by winds and draughts while sweeping out, or carried on clothing or shoe-soles; or from the minute moist drops which invalids diffuse in their immediate vicinity by coughing or talking;
2. **With the food:** first through unboiled milk, also, in case of unsatisfactory inspection of meat through the flesh of tuberculous animals, which, admitted in trade, was not afterwards thoroughly cooked before being eaten;
3. By means of unclean hands and unclean utensils: e. g. in the case of children crawling on the floor, seizing soiled objects (clothing, handkerchiefs and the like) and immediately afterwards putting the fingers into the mouth (sucking fingers, biting nails, licking fingers when turning over leaves), picking the nose, and similar bad habits as putting into the mouth toys, drinking-glasses, eating utensils, wind instruments used by others.

Tubercle-bacilli may also enter through injured or diseased places in the skin or in the visible mucous membrane (unnoticed small sores, scratches, eruptions).

The result of the absorption of tubercle-bacilli usually in the case of children at first a disease of the glands (e. g. of the neck and abdomen) and, in connection therewith,

¹⁾ One-fourth of the corpses of persons who have died from other diseases show internal traces of tuberculosis that had been overcome.

of the lungs, the bones and joints (scrofula of the bones, tubercular excrescences, voluntary limping), the cerebral membrane, etc. In the case of adults infection by inhalation predominates and leads to tuberculosis of the lungs, more unfrequently of the larynx (consumption). Through absorption of the tubercle-bacilli into the skin there is arising tuberculosis of the skin (e. g. lupus, corrosive herpes).

Most usually tuberculosis progresses slowly (chronically); exception: galloping consumption.

C. HOW DOES ONE PROTECT ONESELF AGAINST TUBERCULOSIS?

Each person, even the weakest and poorest one, will highly contribute to guarding himself against tuberculosis by merely combining judgment with self-control.

I. MEASURES AGAINST CONTRACTING TUBERCULOSIS.

1. Let every person, whether well or sick, provide for the safe removal of the sputum, since one cannot detect from the simple appearance whether sputum is tuberculous or not. **Do not spit on the floor of closed rooms** (including street-cars and railway-coaches) or on frequented thoroughfares. **Place in convenient corners spittoons filled with water** which, to ensure safety, should be cleansed at short intervals by disinfecting methods. Hold your hand before your mouth when coughing. Turn away from a coughing neighbor, that does not do so. Articles of clothing should always be kept clean, the trailing of garments should not be tolerated. The clothes, beds, linen, eating and trinkingutensils of tuberculous persons may be used by others only after thorough disinfection. Dry sweeping should give place to moist; if need be, scour with hot soda or a hot solution of soft soap. The raising of dust in the dwelling-room, the work-place, and on the street should be avoided whenever possible. Shun bars or refreshment rooms where spitting on the floor is allowed. Children should be kept out of dusty workshops and from work that develops dust (carpet-beating).

2. Let the strictest cleanliness prevail in the preparation and preserving (guard against flies) as well as in the eating of food, especially of that which is eaten raw. **Milk should be boiled and meat cooked thoroughly before being eaten**; the boiled milk should be covered and kept as cool as possible.

3. The hands including the nails, the teeth and mouth should be cleansed frequently and thoroughly. Putting the fingers into the mouth or nose, and also scratching the face should be discontinued. Every sore should be protected against impurities by suitable bandages.

4. With regard to the tuberculosis of animals it will suffice to say that in cattle it usually affects the lungs, in pigs usually the glands of the neck or the intestines; in the former, commonly, through inhalation, in the latter through the food, chiefly through the unhoiled refuse and skim milk of dairies. Proper means of extirpation are: gradual sorting out of tuberculous cattle, chiefly of those that betray visible signs of the disease (tubercular knots on the udder, coughing with emaciation and rough hair, and the like) from special dairies for childrens' milk and establishments for breeding; but also removal of all other animals feverish from the injection of tuberculin separation of calves from tuberculous mothers; frequent exercise of the calves and young cattle, if possible of the older animals too, in the open air should be encouraged, the use of hoiled milk only and hoiled dairy residues for the feeding of pigs²⁾; keeping the stalls clean.

II. MEASURES FOR STRENGTHENING THE BODY.

It will be impossible to extirpate all tubercle-bacilli, therefore it is indispensable so to strengthen and harden the body that the absorbed germs can not take hold upon it. The principal means³⁾ are:

²⁾ Many large dairies now heat all the milk before manufacture so that all danger is removed.

³⁾ Further particulars in the „Gesundheitshüchlein“, compiled in the Kais. Gesundheitsamt, 13. Ausgabe, Berlin, Jul. Springer 1908. Price 1 Mk.

Plain and wholesome food, which by judicious selection need not be expensive. Dainties and intoxicating drinks should be avoided;

A dwelling accessible to the entrance of air and light; rather in the suburbs than in the heart of the city; **the best room selected as a sleeping-room**;

Plain, durable clothing made of material not too thickly woven, neither too warm nor too cool; in the case of a person in repose or of a sedentary occupation warmer than in that of someone frequently in motion; discarding the follies of fashion that hamper the free movement of the body, e. g. the corset and belts.

Only after defraying the necessary costs of dwelling, eating and clothing other expenses may be considered.

Let order and cleanliness have the first place in the whole conduct of life. Wash the whole body daily with moderately cold water or rub it vigorously with a rough, damp cloth, bathe in pure river or sea water, or take a shower bath (sparing the head), keep hair and beard, teeth and mouth, also the nails clean. **Breathe through the nose keeping the mouth shut**; the former is the natural filter for impure and injurious substances. If breathing through the nose is difficult, be examined by a physician; it is often easy to remove the impediment.

Seek to perform your work in accordance with your health. Take advantage of prescribed measures for protection. Avoid a bent position in intellectual work. If you are an employer, consider how you may remove noxious substances or prevent such from arising (dust, smoke, etc.). The time for work and rest should be in proper proportion.

Devote the hours free from work to the strengthening of those parts of the body that had little opportunity to be exercised during work. Take exercise outside of your dwelling. Draw in long, deep draughts of fresh air while holding the hands pressed against the sides. Accustom yourself also to being in the open air in unfavorable weather. Change wet clothing and shoes. Gymnastic exercises — especially when out of doors — suited to the conditions of the body, together with tramps on foot, games, moderate cycling, rowing, swimming and the like are the best allies in the fight with tuberculosis.

Go to bed at a reasonable hour. Avoid excesses of every sort. They destroy in a few minutes what has been gained in years. As little as a glass of moderately cool beer, a cup of moderately strong coffee or tea, a cigar — enjoyed at the proper time — injure the normal adult body, as much every intemperance injures it.

Finally, shun intercourse with persons who are suffering from infectious diseases; if duty or profession demands such intercourse, then bear constantly in mind the prescribed measures of precaution. If you move into a house where a tuberculous person has lived, recently have it first disinfected.

D. ADVICE TO PERSONS IN GREAT DANGER.

Every one should study the fore-going rules of health, but especially all those persons who, from any reason whatever, have cause to fear tuberculosis more than others: weakly persons, such as have a long and slender figure with a flat chest, particularly if they descend from tuberculous parents; again, such as have a reason for the assumption that they have already taken up the germs of tuberculosis through intercourse with consumptive persons (relatives, guardians, fellow-workmen, or playmates) or in consequence of their own sickness in childhood from scrofula and the like; also those whom their vocation endangers (who work in-doors or in the midst of dust, &c.); finally those recovering from a severe sickness, from measles, whooping-cough, influenza, and generally such as have suffered or are still suffering from diseases of the lungs or chronic affections of the throat, diabetes, chlorosis, or are inclined to severe losses of blood (nose-bleeding and the like).

Let him, who possesses a body little capable of offering resistance, have regard to this fact when he chooses an occupation: an occupation that leads into fresh air and steels the body through exercise, is better than a business that confines within doors. Persons with sensitive respiratory organs have to avoid not only dust (and consequently dusty trades) but also smoke (tobacco smoke included) and cold, rough winds or else to take corresponding measures of precaution; talking in the cold air or while walking should be discontinued and one should guard against catching cold and excessive bodily exertion.

Not less important is the sensible observance of general measures of precaution in every place where people assemble in large numbers through their occupation or from other causes (in schools, boarding schools — corresponding conduct of tuberculous teachers — factories, hotels, poorhouses, orphanages). Neglect of tuberculosis by individuals endangers the general public.

E. ADVICE TO DISEASED PERSONS.

If symptoms appear that arouse the suspicion of a not merely transient disease of the **respiratory passages**: repeated coughing (dry or with sputum), frequent pains in the throat, breast, or back, lasting depression or tendency towards exhaustion, recurring fever, especially in the evening, with night sweats (though the covering be light), traces of blood in the sputum or even a discharge of blood from the throat, **then a radical examination by the physician (also of the sputum for tubercle-bacilli) should be made as soon as possible.** If the suspicion is not confirmed, yet the advice given under D. should be carefully followed. If the suspicion is confirmed, then the regulations prescribed by the physician are first of all to be observed. **No cure is of avail if the patient himself does not contribute thereto by his general hygienic conduct and rigid observance of the prescribed measures of precaution.** The patient should realize the double duty of taking thought for his own cure; in order to become once more a useful, earning member of human society, **and also of preserving his family, servants, and neighbors from infection by heeding the precautionary regulations.** Incipient tuberculosis is often curable; advanced seldom. Success depends chiefly on timely anticipation.

Especial attention should be paid to the sputum; it should neither be cast upon the floor nor swallowed, but rather be vented into a separate, suitable vessel, which should be regularly disinfected; better still are the saliva bottles (something like the Dettweiler) which the patient takes with him. Should it be necessary at times to vent the sputum into the handkerchief, the latter should be boiled before becoming dry.

The disease can also be communicated by kissing. An evidently consumptive person should be urgently dissuaded from marrying; let him wait until he is cured. Tuberculous women should not suckle or nurse children.

The cure is most surely effected in a sanatorium devoted especially to the restoration of consumptives and directed by an experienced physician. After not too short a sojourn (not under 3 months), the obedient and attentive patient often regains not only his health, but appropriates to himself also the rules of living necessary to avoid relapses.

To poor consumptive people advice and help is given free of charge by the information-and-care-offices recently so often established (Auskunfts- und Fürsorgestellen) and by dispensaries for tuberculous people.



hen compared with most of the great civilised states **Germany** offers particularly favorable conditions for the development of tuberculosis by its continental climate, its rough changeable weather and its density of population quickly increasing especially in the industrial parts. The **number of inhabitants** on the territory of the present German Empire (**table I**) amounted to 24 833 000 in the year 1816, to 36 114 000 in 1855, to 60 641 000 in 1905. The first period thus showing an annual increase of population of 1,2 per cent. on an average, this increase amounted to 1,4 p. c. annually in the last period. At the same time the number of large towns, that means towns of 100 000 and more inhabitants, rose from 2 to 6 and 41, their number of inhabitants from 307 000 to 1 095 000 and 11 509 000 or from 1,2 p. c. of the whole population in the year 1816 to 3 p. c. in 1855 and 19 p. c. in 1905.

How the classification of the present living people results according to the **different age-periods**, will be shown by the sectors of the circle on **table II**, while the coloured circle to be found at the right side points out the **relative ages of the dead**. One notices at once the comparatively rich harvest that death gathers already in the first year of life.

Which are the relative proportions of **general mortality** and **mortality from tuberculosis** in the different age-periods is to be seen separately for men and women, on **table III**. Next to the age from 60 to 70 years with 460 deaths annually for each 10 000 of male persons, respectively 386 deaths of females, there occurs the largest general mortality, namely 279 respectively 238 annual deaths for the age-period of less than 15 years, whilst the age from 15 to 30 years, with only 47 deaths amongst men and women, is the most favoured one. Remarkably different from these figures will be found those of the mortality from tuberculosis which show by far the least number of deaths at the age of less than 15 years. Amongst men mortality increases considerably at each age-period, viz. from 5 deaths at the age of less than 15 years to 18 at the age from 15 to 30 years and to 29 and 38 deaths at the ages from 30 to 60 and from 60 to 70 years; amongst women already at the age from 15 to 30 years 22 deaths from tuberculosis occur for each 10 000 persons. which number does not show considerable change in the two following age-groups. When compared with the total number of deaths, especially at the age from 15 to 30 years more than one third of all deaths that occur in this age-group are caused by tuberculosis, viz. 39,3 p. c. amongst men and 46,5 p. c. amongst women.

Only small differences will be found in the mortality from tuberculosis (**table II** below on the left side) that is registered in **large cities, towns** (towns with 15 000 to 100 000 inhabitants) and **smaller communities**. Regarding the connection between tuberculosis and **agriculture** on the one hand and between tuberculosis and **industry** on the other (**table II** below to the right) it has been found out that amongst the receivers of pensions from industrial works nearly twice as many became invalids on account of consumption as amongst the receivers of pensions from agricultural occupations.

Of what importance **pulmonary tuberculosis** is, when **compared with other important diseases**, as a cause of death for the different ages, may be seen on **table IV**. It will be found there a representation of the frequency of tuberculosis with special comparison to the inflammatory diseases of the respiratory system, diphtheria, diseases of the digestive system, new growths, typhoid fever and accidents. Accordingly the deaths from tuberculosis at the age from 15 to 30 and from 30 to 60 years take by far the first place. No sooner than in

the higher ages of more than 60 years their number is surpassed by the deaths caused from inflammatory diseases of the respiratory system, from abscesses and weakness from old age, besides in the age-period of less than 15 years by the deaths from catarrhs of the stomach and of the bowels. Tuberculosis, in the years of youth, is but very little less dangerous than diphtheria, while typhoid fever in all age-groups cannot earnestly be compared with it.

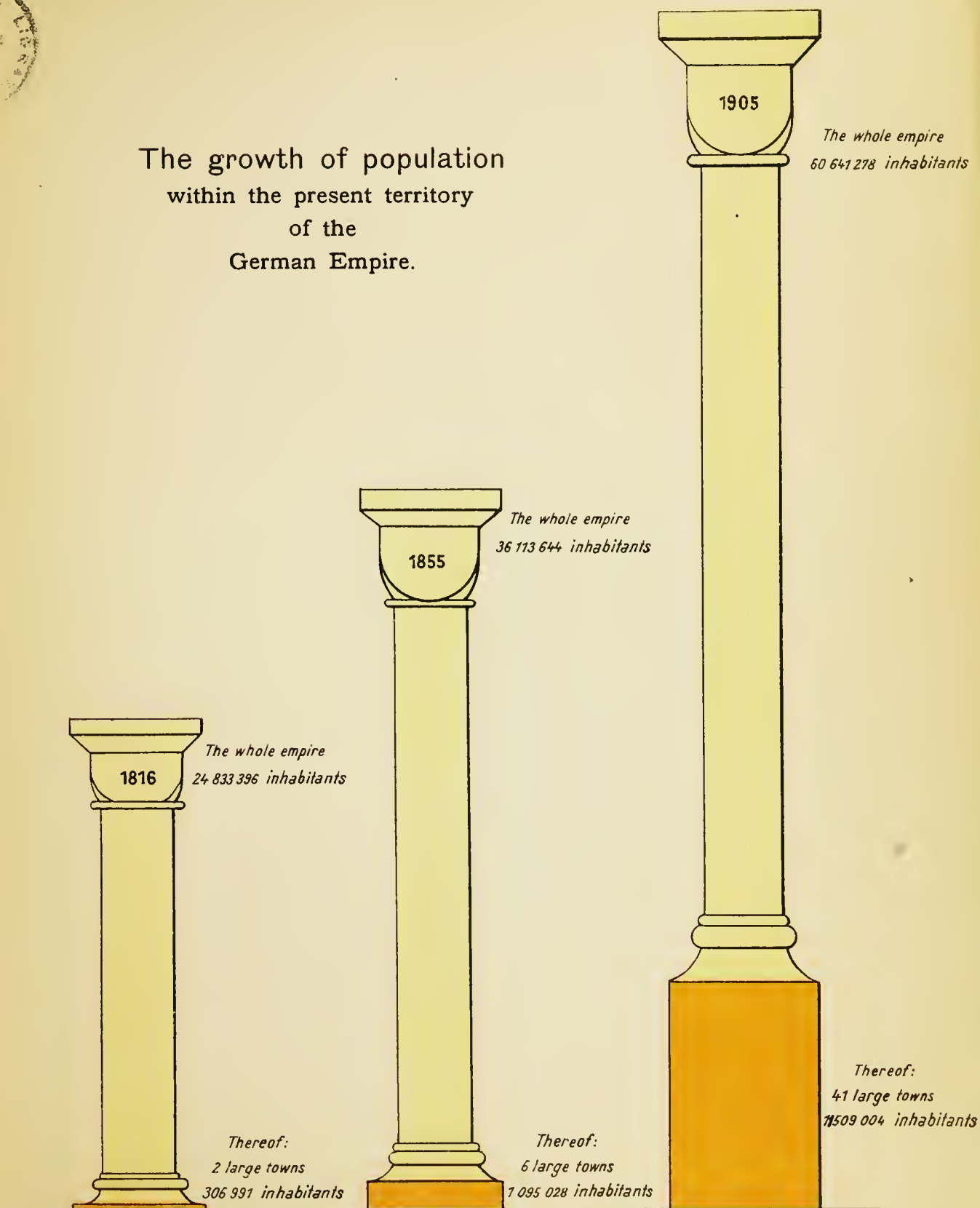
As to the very considerable **decrease of mortality from tuberculosis in the years 1877 to 1904**, **table V** gives information. Within this space of time mortality from tuberculosis of the lungs fell from 37 to 19 of each 10 000 persons, that means nearly half the number, in all German places of at least 15 000 inhabitants, and by the second curve below on **table V** it may be seen that in this period the mortality from tuberculosis fell even more than the general mortality that also decreased considerably. Accordingly, in the year 1877, 13,8 p. c. of all deaths were caused by tuberculosis of the lungs, while no more than 10,4 p. c. in the year 1904. One notices on **table VI** moreover that the decrease of the mortality from tuberculosis is strongest in the higher and middle ages that are most attacked by tuberculosis, less however in the age-group of persons under 15 years.

Table VII gives a geographical view of the **mortality from tuberculosis of the lungs in the different territories of the German Empire** in the years 1892/93, **table VIII** delivers a corresponding view for the years 1905/06. It is evident that nearly everywhere in the Empire tuberculosis shows a considerable decrease, but especially in those parts where it found its widest spread before.

Table IX represents a view of the number of **public sanatoriums** founded in the Empire within the last 12 years for **consumptive people** (adults and children), of the **country colonies**, **invalid homes** and the **institutions for children suspected to be tuberculous or scrofulous**. **Table X** gives a view about the **recovery places in the woods, forest-schools, enquiry bureaux and dispensaries** for consumptive people that are all lately founded. In the spring 1908 there existed in the German Empire 99 public sanatoriums with 6500 beds for men and 4539 for women and 36 private sanatoriums for consumptive people with 2175 beds; besides 3 public sanatoriums are still building. There were 18 sanatoriums for tuberculous children with 837 beds while in 73 sanatoriums scrofulous children or such as to be suspected of tuberculosis are nursed. There are 2 country colonies for consumptive people, one for children, and 12 nursing homes and invalid homes for persons that suffer from the highest grades of consumption. There existed 82 recovery places in the woods, 3 forest-schools. 175 enquiry bureaux and dispensaries for consumptive people were in action in the territory of the empire without counting those of the Grand Duchy of Baden where no less than 53 district committees and 481 municipal committees perform these functions. A great many of the above mentioned institutions received subsidies from the **German Central Committee for Combating Tuberculosis**. The Central Committee spent as subsidies up to now 2 025 750 Mark.

For popular instruction several pamphlets have been edited. One of them „**Tuberkulose Merkblatt**“ has been published by the Imperial Board of Health and will be found hereby. It has been distributed up to now in more than 2 000 000 copies. There exist moreover 2 **permanent museums** and 3 **itinerant museums of tuberculosis**. Their number will increase considerably in the next time.

The growth of population
within the present territory
of the
German Empire.

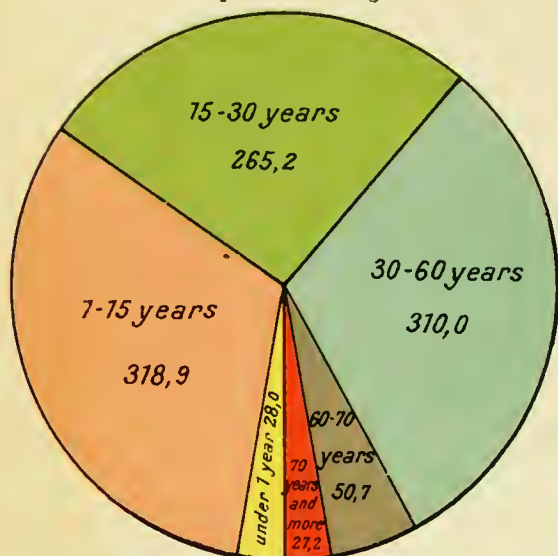


*Whole column: Territory of the Empire,
socle of the column: large towns, i. e. towns with at least 100 000 inhabitants.*

The living population marshalled according to age-periods

on 1. december 1905.

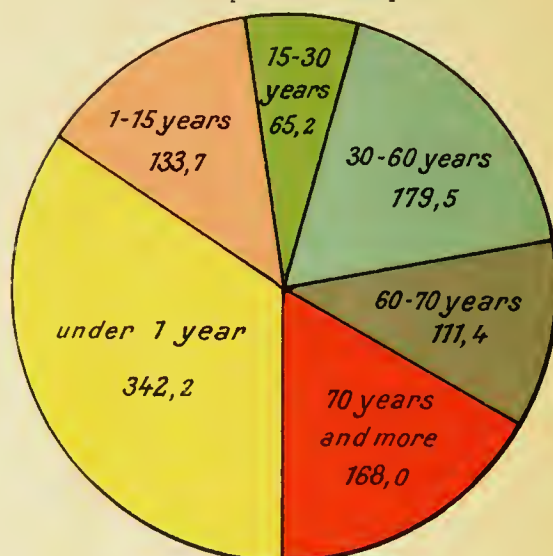
Rate per 1000 living



Relative age of dead persons

in the year 1905.

Rate per 1000 dead persons



The frequency of the deaths from Pulmonary Tuberculosis

in the

large towns
(places with at least
100 000 inhabitants)

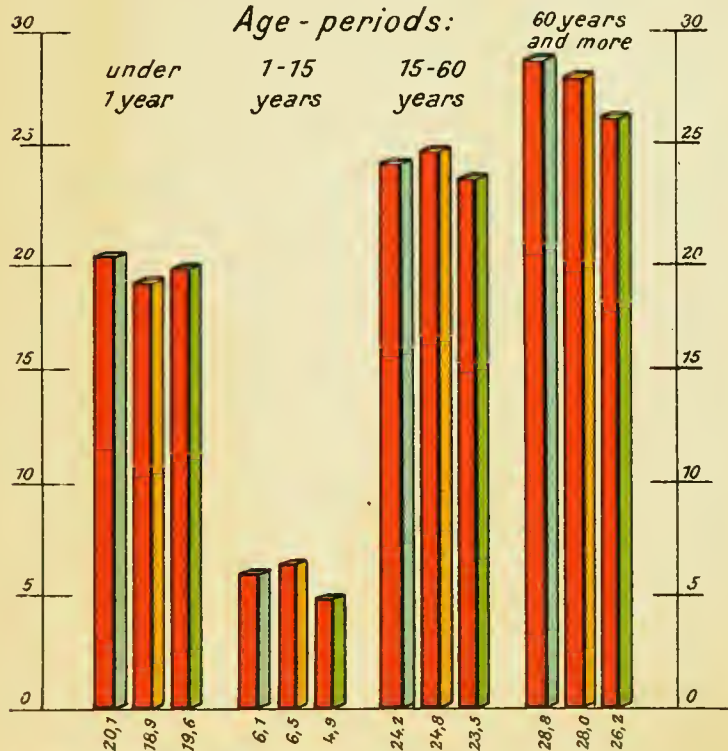
middle towns
(places of 40 000 up to
100 000 inhabitants)

smaller communities
(places up to
40 000 inhabitants)

1905.

Death-rate per 10 000 living.

Age-periods:



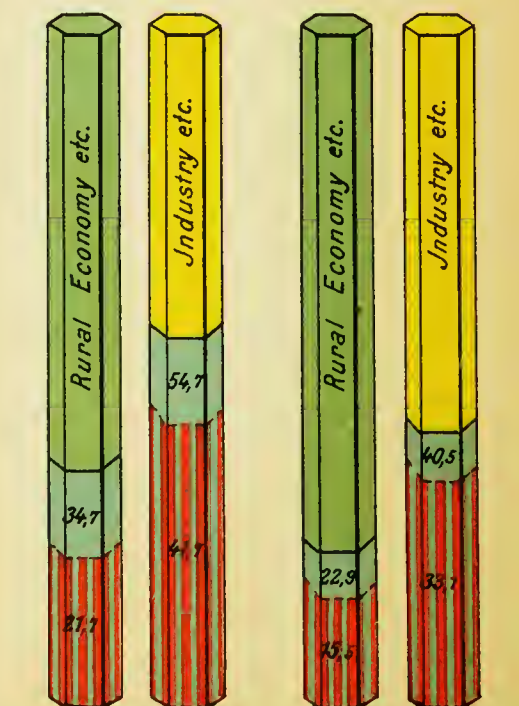
Large towns. Middle towns. Smaller communities.

The Tuberculosis and the other diseases of the respiratory organs as causes of being declared invalid in the age-period 20-50 years

Rural Economy,
Horticulture and
Forest-matters

Industry,
Building-matters
and Minework.

Rate per 100 invalids.
Men Women

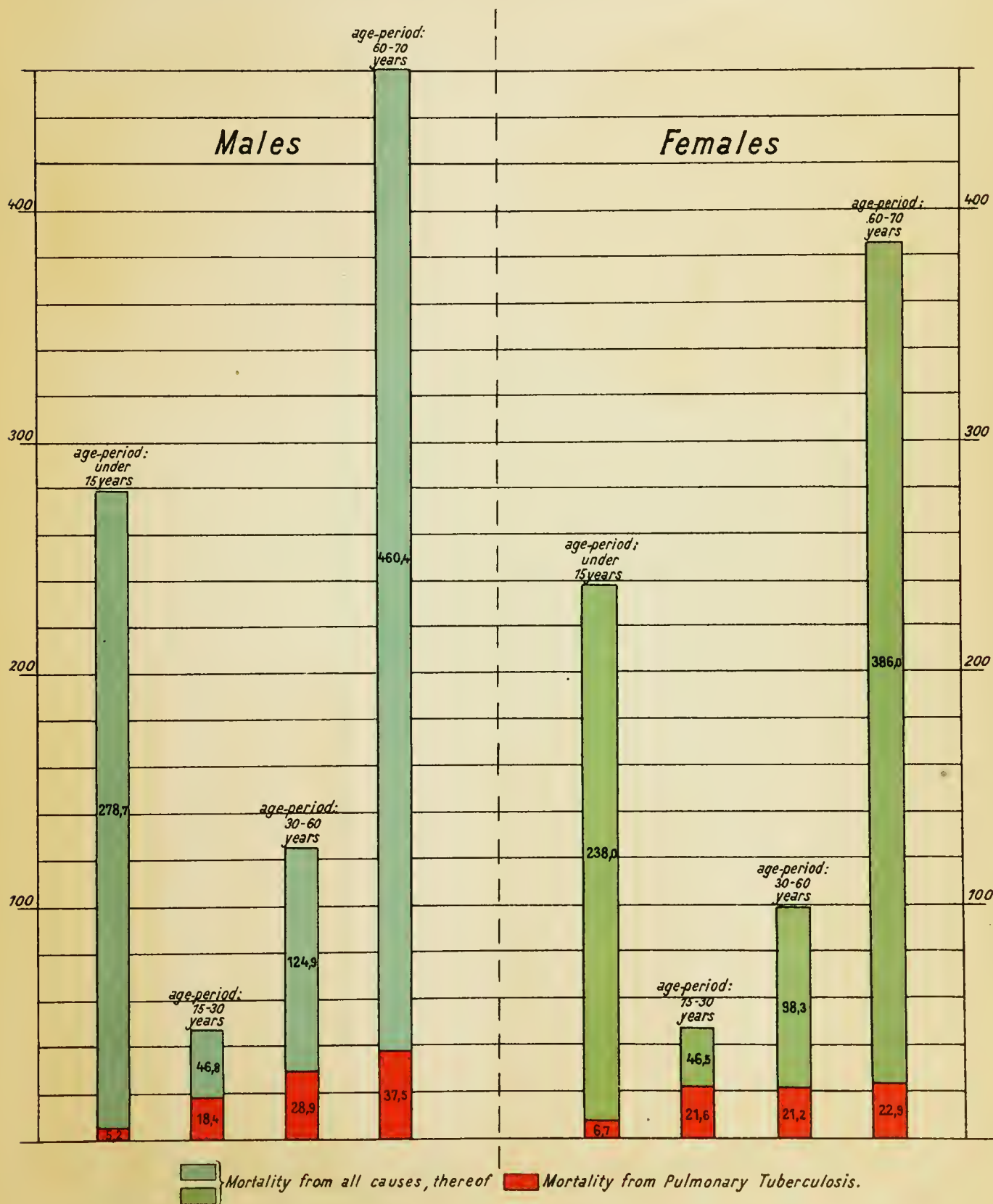


Diseases of the respiratory organs.

Pulmonary Tuberculosis.

The deaths from Pulmonary Tuberculosis
as compared with the deaths from all causes among males and females
in the age-periods from 0-15, 15-30, 30-60, 60-70 years. 1905/06.

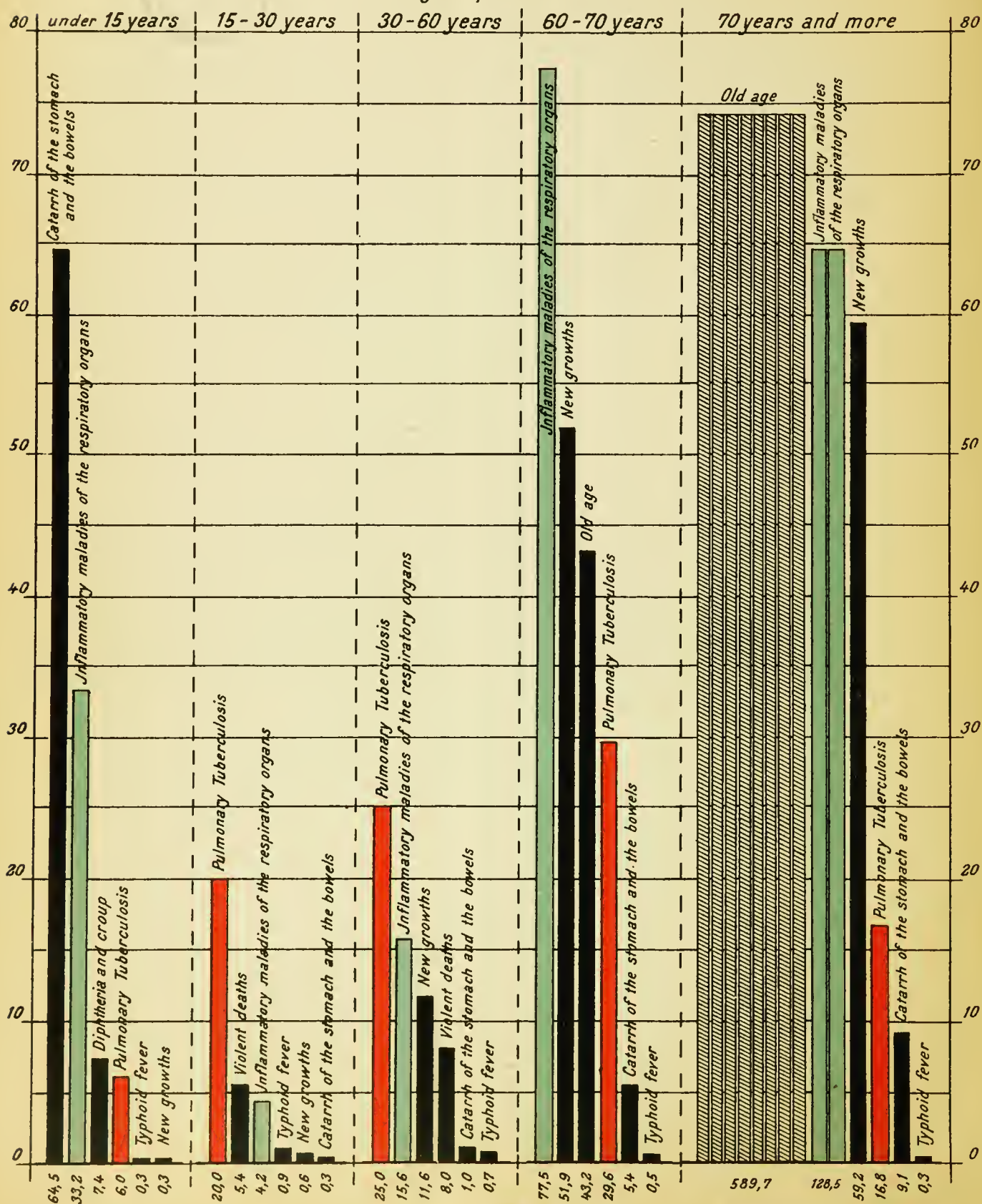
Death-rate per 10000 living



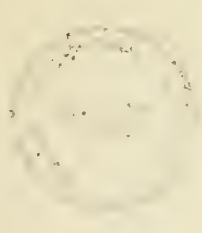
The Pulmonary Tuberculosis as a cause of death in comparison with other important causes of deaths in the different age-periods in the German Empire 1905/06.

Death-rate per 10000 living.

Age - periods:



Please turn!



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